Using the Integrated Management System and Approach SIPOC in higher education for the Evaluation and Improving the Quality of Life of students

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Abstract In industry, the quality can be guaranteed (insured) by compliance with the standards for organizational functioning, which are certain to come out identical products

In a field as higher education, the quality can be probably more approximated by the reachable goals that are in this context related to the university, faculty, students, enterprises, the Ministry, the strategy of the country

Students are certainly the first to benefit from a higher education of quality. But the notion of "customer"; from the first definitions of quality "Ability of a product or service to satisfy, at minimum cost and prompt the user needs. (ISO 9000 1982) "; cannot be limited to them. (2)

Thus the society is regarded as another major beneficiary of higher education of quality. (2)

It must provide answers to economic, intellectual, scientific and cultural expectations of the society (2).

Certainly, an outcome of higher education of "quality" can be completed only by combining several factors (7):

• The introduction of quality assurance tools: the self-assessment through internal audits, external evaluation, accreditation (in relation to an external guide such as ISO), and empowerment.

• Monitoring of an integrated management system: Process mapping of higher education activities; and their control indicators, the establishment of a documentary control system, the establishment of evaluation processes (audits ...), and the definition of continuous process improvement criteria.

And among the processes identified in the development of process mapping in higher education, the assessment process that could be the final phase of qualifying products (students) for the end user (Market of employment); and the ability of the product to meet a need expressed or implied could be a measure of performance of such a process, that qualifies as key performance indicators (KPI Key Performance Indicator) (3).

Thus, the introduction of performance indicators for the identified process will help the control vision for continuous improvement.

It is in this perspective that the proposed combination of the integrated management system approach with SIPOC (Supplier, Input, Process, Output, Customer) will ensure the needs of the management of the higher education system.

Thus, the student is the customer of his teacher, and the same vision is applied with respect to: <university, companies>, <teacher, institution administration> ...

Keywords: Integrated Management System, Six Sigma , Approach SIPOC

I.   PRACTICAL ANALYSIS OF INTEGRATED MANAGEMENT SYSTEM IN HIGHER EDUCATION

1.   Overview of IMS organization

The central body (ministry, the central committee of management of the sector ...) draws a roadmap that will be cascaded in different universities and declined to all institutions.
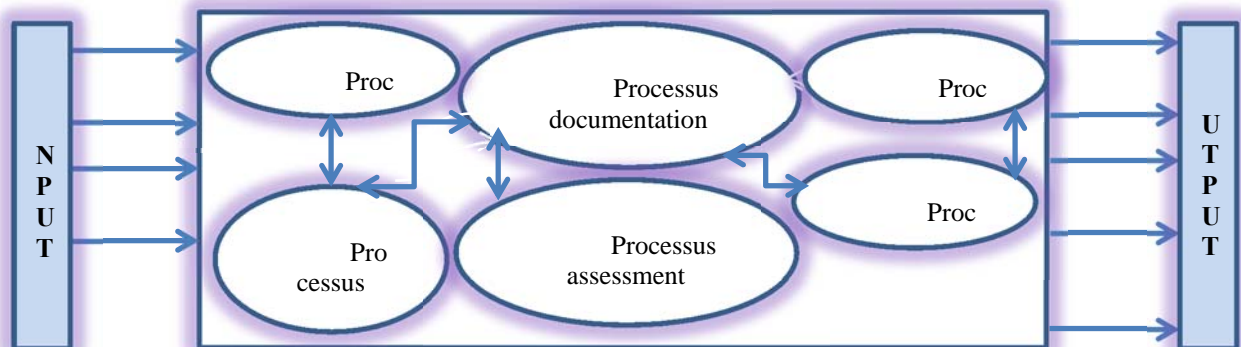
Diagram.1. System'view of a higher education institution.

An institution of higher education is seen as a system in which lies a set of interrelated and organized elements, processes and activities.

The integrated management system is a coherent system integrating all organizational processes in a setting with a coordinated certification on quality, Information Security, health, security, and aspects of the risks associated with the environment.

Targets are set in a defined framework of rules and best practices to apply that allow better management, monitoring and evaluation of the performance level of higher education institutions. The achievement of objectives is pursued in a spirit of continuous improvement over time and priorities defined jointly between university, university steering committee and ministry. Evaluation rules are implemented through annual audits to assess progress and verify compliance with rules and standards.

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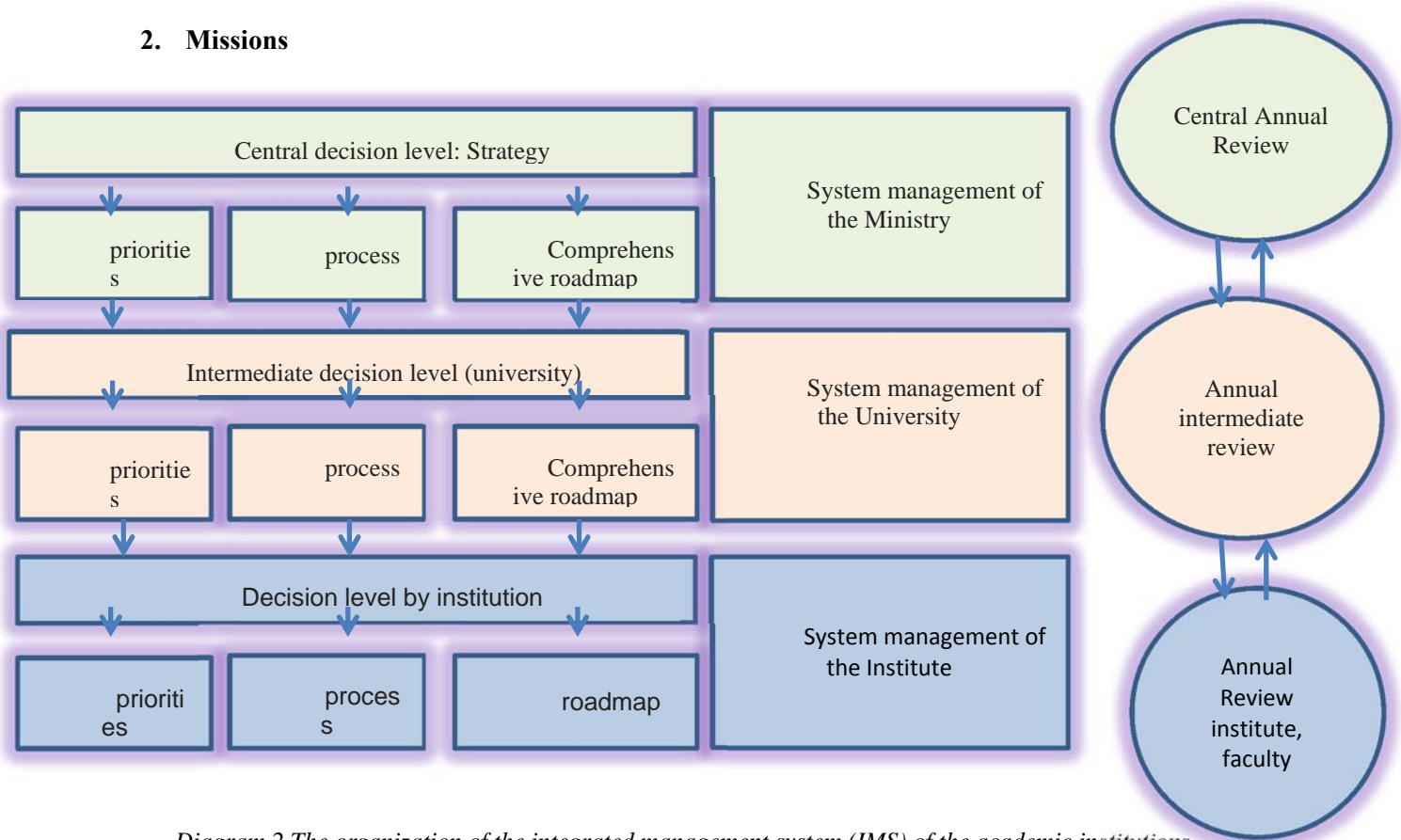
2. Missions

Diagram.2.The organization of the integrated management system (IMS) of the academic institutions

At the central decision-making level of the quality policy (ISO standards and best practices associated) is Defined by setting strategic objectives.

• At an intermediate decision level management review declined from the highest level and put in the form of Operational objectives.

• Internal audits are forms of assessment, which also resulted in other types of audit: Annual assessment of such Educational programs.

• At the policy level institution, educational policy can be defined by developing new methods of student assessment: self-assessment, peer assessment, assessment group.

II. PRACTICAL ANALYSIS OF INTEGRATED MANAGEMENT SYSTEM IN HIGHER EDUCATION

1. Process mapping

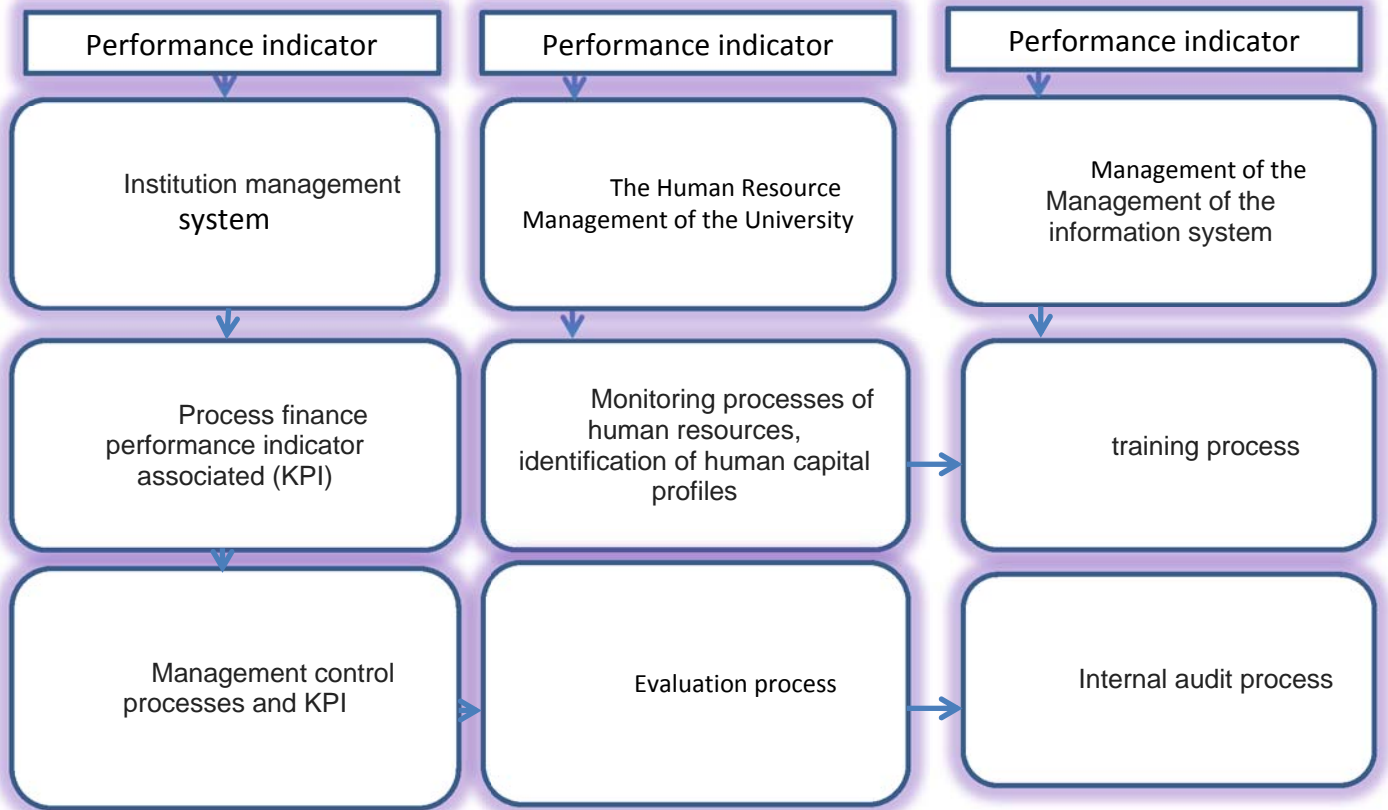To identify the processes that makes up the system:

Diagram.3. Mapping process

2. Scorecard

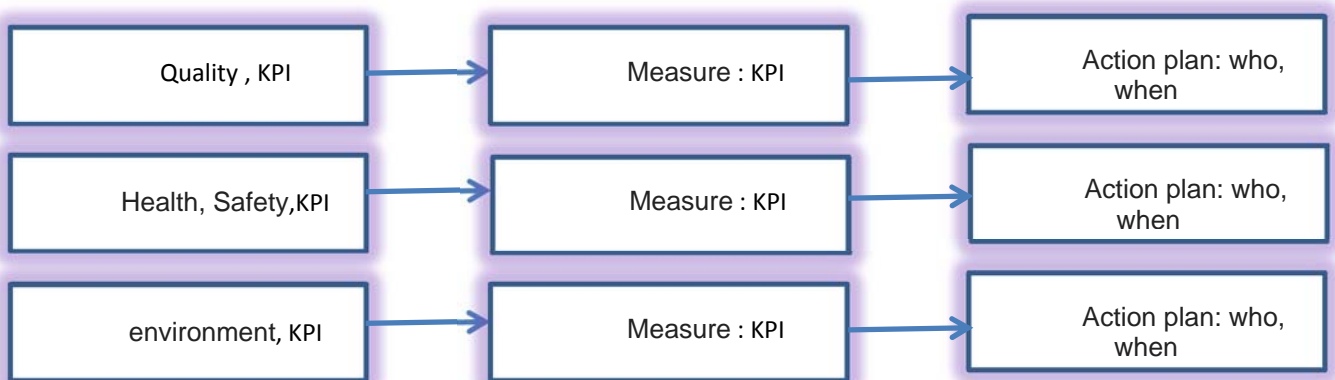Periodic assessment of the identified processes, their KPI, and decided action plan :

Diagram.4. Elements of the Balanced Scorecard

Process	efficiency quality	efficiency Health and Safety	efficiency environment	Remarks
Institute Management				-Improve Effective internal communication -Unifier Performance indicators
HR Management of the institute				- Incorporate a safety and environmental culture in all approaches
Training				- Review of training modules specified by economic operators
scientific Research				- Foster a climate of trust between the university and the economic operators

Diagram.5. Performance process identified

3. Internal audits

Internal audits within the university and higher education institutions; follow:
For each identified process, the approach will be evaluated (the management system and associated documents), its operational field deployment and control of the process (with the associated performance indicator:
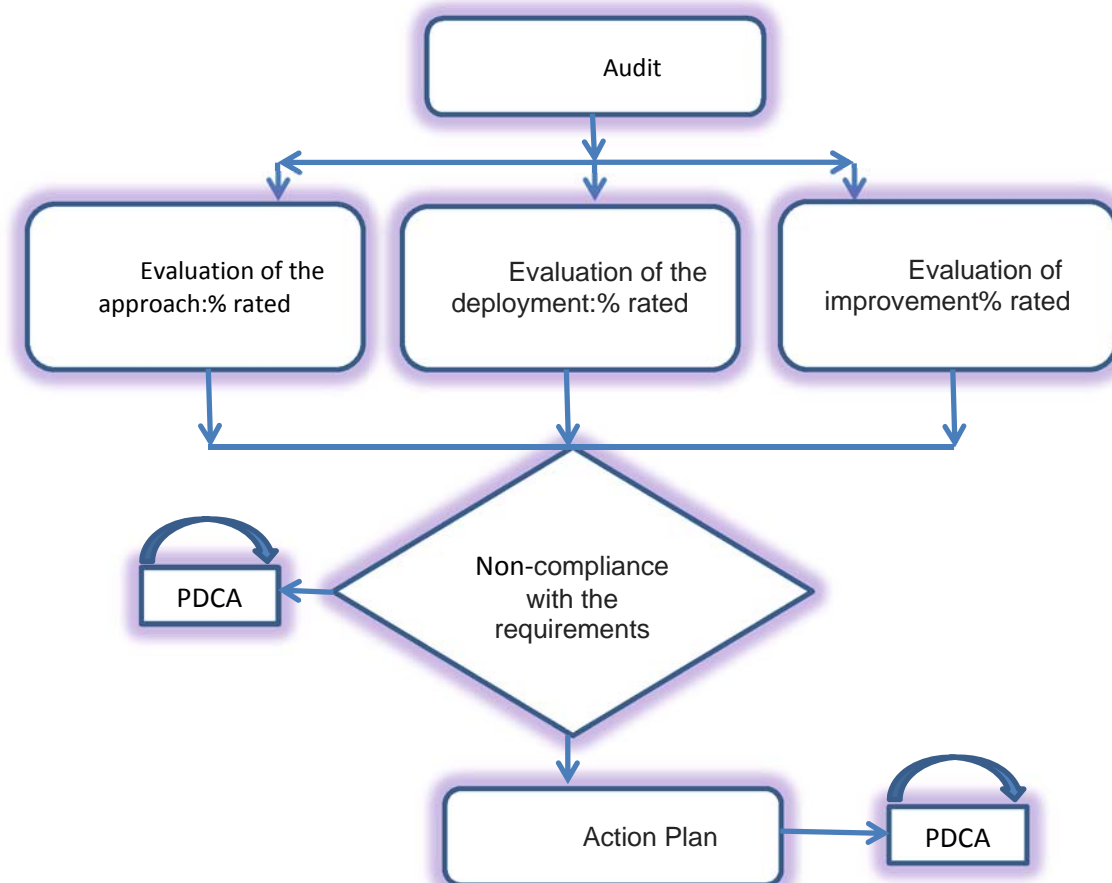

Diagram.6. Process audit (Overview of the evaluation)

Unidentified compliance will be subject to the action plan, identifying the area of improvement. The continuous improvement approach will be followed in both cases: to maintain performance and ensure the implementation of the defined action plan.

4. Document control system

-The Operating procedures should be documented, ensuring their updates, starting with management procedure of records.
 - Set up a portal for sharing documents.

5. Risk management

The SIPOC approach identifies the link between higher education and the environment surrounding it, and the analysis of environmental impacts and aspects related to health and safety is an input at this as that the company's supplier in the SIPOC diagram.

Diagram.7. Definition of environmental impacts and aspects of health and safety

6. Identification of non-conformances, corrective actions and preventive improvement

The sight of overall assessment includes assessment of working methods, evaluation of the content of the training modules, assessment of adequacy "training / needs of the labor market," and evaluation students completing a training   module.
Thus, the implementation of the actions of corrections, improvement or prevention, cannot be completed implementing a system that measures Non-compliance from these assessments (6).

III. PRACTICAL ANALYSIS OF SIPOC APPROACH

1. SIPOC Approach

The SIPOC provides a useful preparation for the detailed mapping of the process to be studied with reference to the results from the SMI.
SIPOC (1) means:
• S as SUPPLIER identifies the supplier or suppliers of the process to be studied (the teacher is a student's supplier, enterprises are suppliers of the institute or its Management Committee, the Dean is a supplier of its faculty ...)
• INPUT I as an inventory of the main steps of the process entries:
The load time of a module is an input, the profiles requested by economic operators is input, the description of jobs (job description) of the company is an input ...
• P as PROCESS, lists the steps, major operations of the process:
The training process, the learner assessment process, the overall evaluation process (internal audit)
• as OUTPUT, an inventory of the outputs of the main steps of the process:
The University provides statistics on its laureates, their training modules , skill levels ... for the economic operators.
• C as CUSTOMER identifies the intermediate or final customers:
The student is the institute customer, and the company is the academic institutions customer …
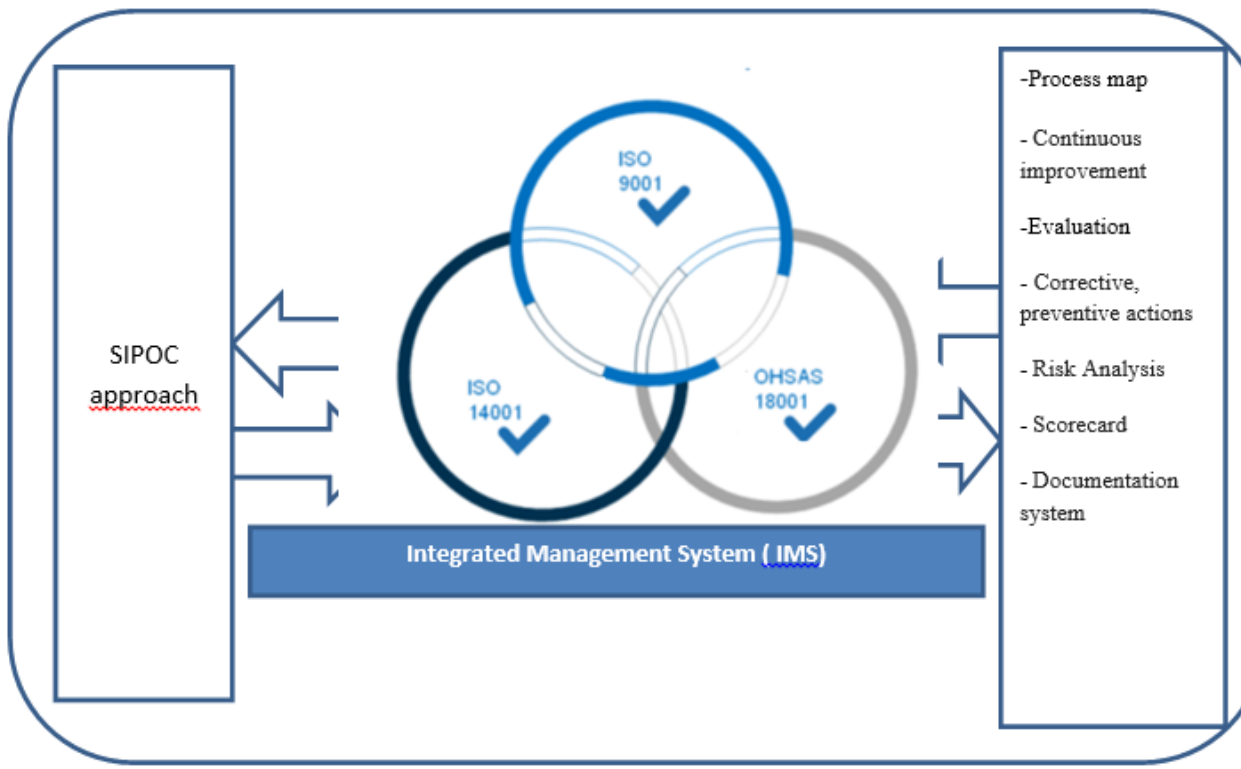
Diagram.8.SIPOC approach combined with driving integrated management system

In Six Sigma (Motorola trademark), the SIPOC is used to describe the business process which we want to improve the quality.
To this list of data, it is important to add the requirements of operations and the measurement means.

2. The use of SIPOC approach

The National Charter of Education and Training cites to "have the learner at the center of pedagogical action and developing a competency-based approach" to close the "gap" training / employment.
While these actions have a significant impact on the achievement of defined objectives, however they must be complemented by a clear definition of the interactions between all stakeholders in the education / training.
Thus, Having an effective educational program, an academic body of the first rank, and a proper training environment, does not in any way a higher education system that meets the expectations of society, whether these expectations are not identified.

3. Elements of evaluation

Following the approach proposed (SIPOC), the student is a recognized provider of the customer (the teacher); Professor Deliverables are listed in column (output), while the input elements are listed in the input column.

Supplier	Input	Process	Output	Customer
Professor (teacher)	Workload	Training process	overall satisfaction	Student
	Suitability : profile / taught modules	Process KPI		
	educational Facilities		Level of difficulty	
	Speech clarity, level (flow, articulation) :Teacher		During rhythm	
	The motivation of the teacher		Teacher's pace	
	Enrolment		Professor intelligibility	
	Number of groups			
University administration	faculty	Administration process	Satisfaction of being at university	Student
	governing body	Process KPI	Satisfaction of the university system: care and maintenance	
	Procedures		Access to the university library resources	
	Process map		Access to student residences	
			Degré de satisfaction des activités extra-pédagogiques	
			Listening center, social and psychological assistance	
			Equitable university procedures	
University administration	Procedures	HR management process	Satisfaction	Professor
	Faculty	KPI process	Access to resources for lesson preparation	
	Process map		Sense of security when teaching	
			Career development within the university	

Table.1.SIPOC Scheme applied to teacher, student, and university administration

SIPOC approach within the faculty and with its external stakeholders (society, companies, other domestic or foreign institutions ...)

Supplier	Input	Process	Output	Customer
Higher education institution	Skills expected by entreprises	Training	Declination of skills through training programs	Enterprises
	funding		Assessment system	
	Human capital		Number of hours	
			educational modules	

Table.2.SIPOC approach (company, institution of higher education)

The proposed approach can be applied to identify the interactions between professor of language and communication modules, the department of language and communication and the student.

Supplier	Input	Process	Output	Customer
Professor	French Language Module hourly load (60h)	Training	Upgrade module in French	Department of Language and Communication
	Hourly load methodology Module (40h)		Module: synthesis techniques and technical reformulation	
	Communication skills (24h)		Module: Taking notes	
	English Module (20h)		Module active listening	
			Time Management Module	
			Strengthening professional skills in language and communication	
			Technical module of meetings and reports	
			Resume, job interview	
			Presentation skills, public speaking	
			Staff development	
			Teamwork	

Table.3.SIPOC approach (Training Module Language and Communication)

Performance indicators to measure ownership and ensure continuous improvement in the language and communication department could be set up.

IV. THE REDESIGN OF THE ASSESSMENT BASED ON SMI AND SIPOC

1. Evaluation, overview

In an academic context, the evaluation is the step to ensure compliance or not the final product (the laureats) to predefined requirements, which can be translated from training / employment adequacy ratio.
However, the unary vision of evaluation as a test of learners is limited, since the process is interdependent with other processes.
In this article the evaluation is for a comprehensive, process evaluation of students to the overall assessment (internal audits); evaluation of devices and programs, and assessment of learning (5), teacher evaluation, student assessment and evaluation of the institution, and even the university evaluation.
Admittedly, these assessments will require definition of performance indicators, which will be defined by adopting the SIPOC approach.

2. Assessment of Higher Education in Morocco

Law 01-00 • Article 77 states:
 • The higher education system is subject, in its entirety, a regular assessment, on its internal and external profitability and covering all teaching, administrative and research. This evaluation will be based, in addition to teaching audits, financial and Administrative, on self-evaluation of each educational institution and training, and periodic survey opinions of educational stakeholders and partners, in labor circles, science of culture and the arts.
 • Article 78: The public and private higher education institutions set up a self-assessment system.
 • Article 79: For the conduct of audits and evaluation required by Article 77 above, there will be the creation of specialized regulatory bodies enjoying autonomy and the necessary independence, including one national assessment and an observatory for the adequacy of higher education in economic and business environment.
 And if before the reform of the Moroccan higher education, the evaluation had a partial and casual and wore more about program evaluation projects, evaluation in the framework of the law
 01-00 is global and regular, and focuses on the training institutions and programs, and following the experiences of the evaluation of higher education in Morocco, it was possible to:
 • Evaluate the dynamic development indicators in universities relations and the social environment.
 • Evaluate the establishment of educational, scientific and in their performance and relationship with the environment, to shift these courses.

3. SIPOC approach, in the definition of performance indicators

3.1.Risks management

The assessment is a comprehensive approach that must be seen in a participatory manner with all stakeholders of education / training, which is presented by the proposed approach in the case SIPOC. Thus, the declination of sight 'assessment of learners' to a wider spectrum as evaluating the training process or even evaluation of the evaluation process.

The process must be clearly defined, and through performance and monitoring indicators and based on SIPOC elements identified, continuous improvement process by following the approach (PDCA: plan do check, act)
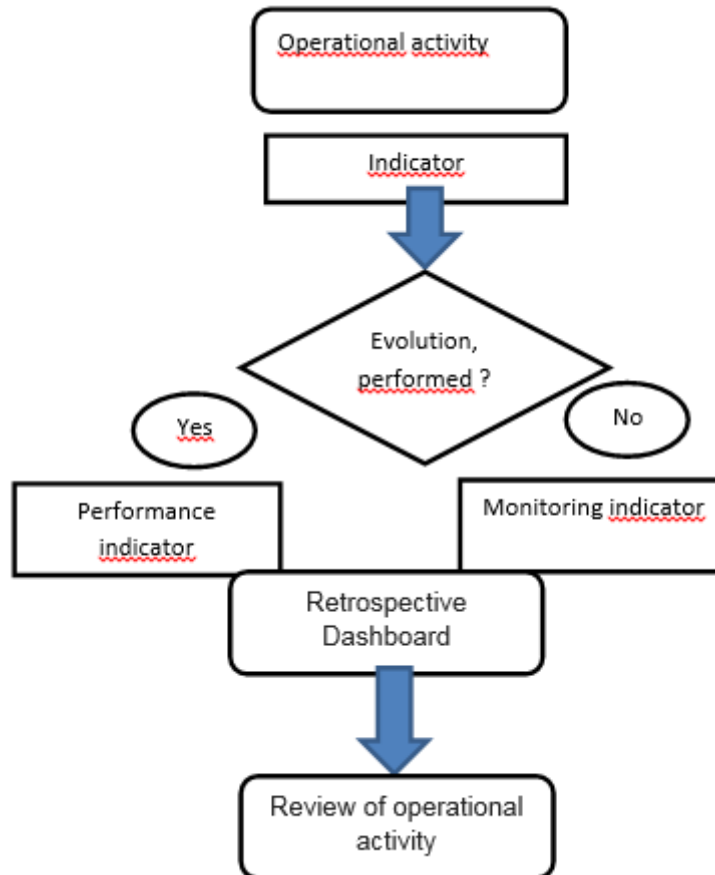
3.2.KPI management

Diagram..9. Performance indicators and monitoring indicator

3.2.1   Monitoring indicators designated according to SIPOC

The monitoring indicator to maintain the existing business; no progress is reported.
Monitoring the performance is maintained, and healing, corrective or preventive actions if necessary
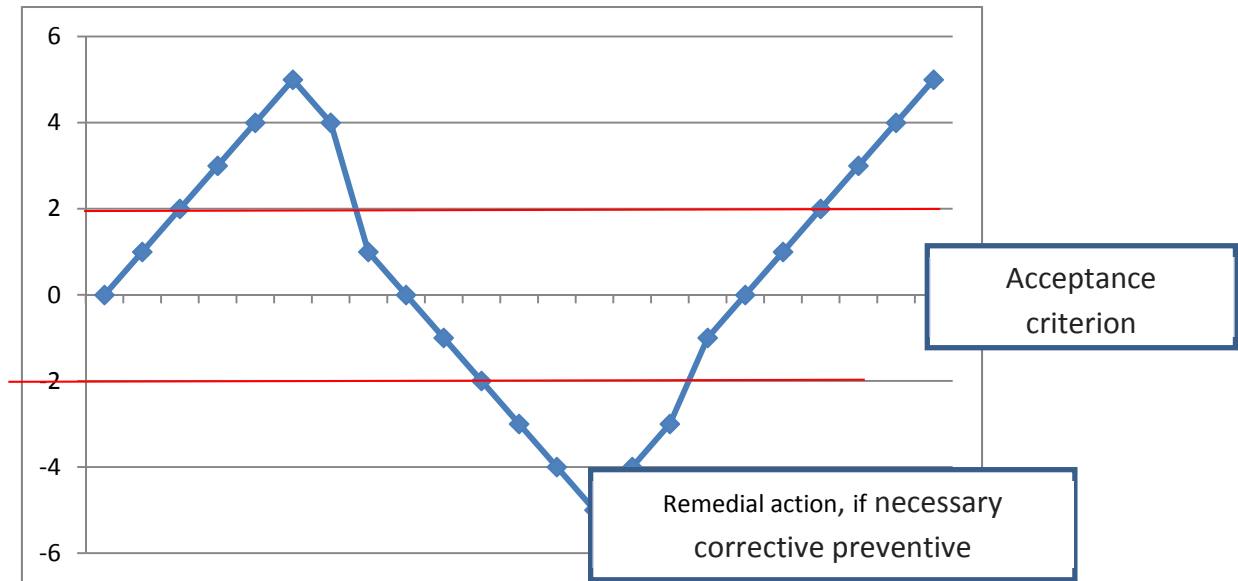are available if the acceptance criterion was not met

Diagram.10.Monitoring indicator of a process

For example, a professional rate for baccalaureate 80% while the acceptance criterion is 93%, generates an analysis of action causes / effects, curative action plan for corrective or preventive to evaluate the adequacy training / employment,

The action may even be declined in the review of the identified processes (training processes Assessment ...), which itself will be cascaded review of training modules, teaching methods.

Admittedly, the set action plan involves all stakeholders identified in the SIPOC

Acceptation criterion	Measured criterion	Action
Integration rate of laureates : 93%	Integration rate of laureates : 80%	• Analysis of causes / effects • Action Plan for the training / employment adequacy • Review training process • Review the evaluation process • Review training modules • Review instructional methods

3.2.2.   Key performance indicators, designated following SIPOC approach

The performance indicator of a process will be set up to boost performance (target achieved)
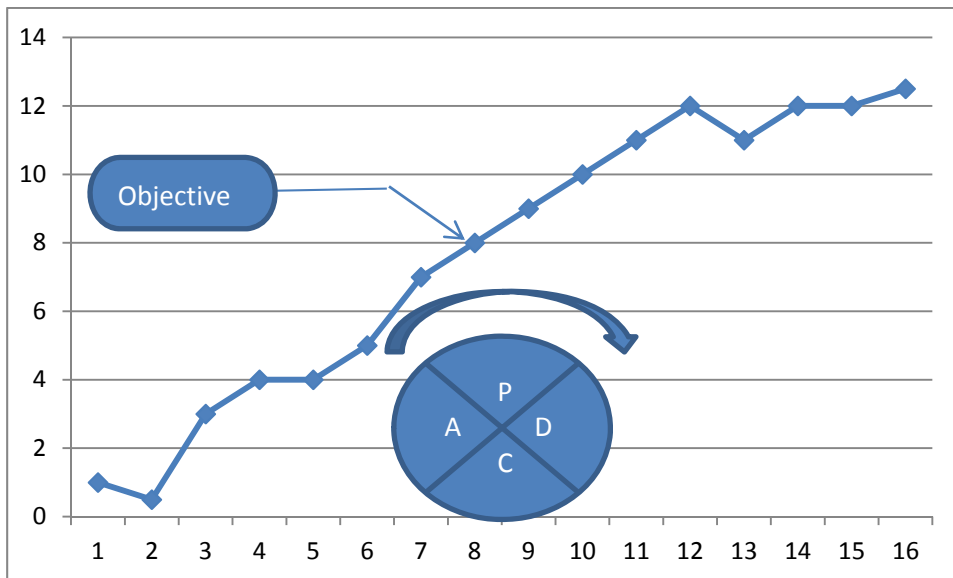

Diagram.11.Performance indicator of a process and PDCA approach of continuous improvement
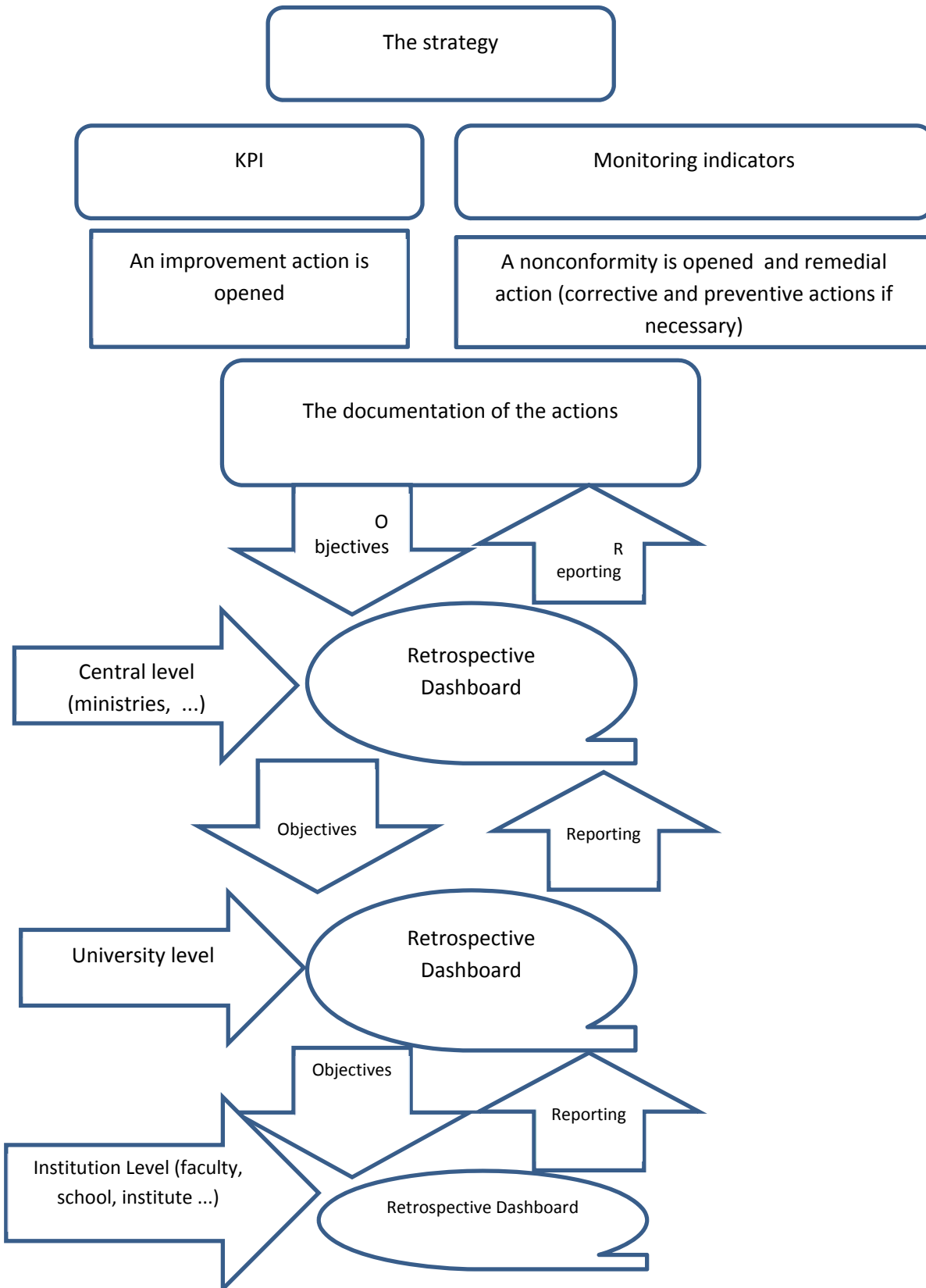
Diagram.12.The establishment of a performance indicator for higher education management system

Their implemented are executed in coordination with all stakeholders identified in the SIPOC, so:
-The Level of satisfaction of the training sessions was involved, the student, the teacher, and the university.

-The Insertion rate of laureates: will a shared indicator between society, economic operators, university and laureates.

-A Rated performance needs to be improved by adopting the approach PDCA (plan, do, check, act)

4 CONCLUSION

The integrated management system can be implemented in a Higher Education context through the identification of process mapping, the establishment Prospective Dashboard, the implementation of a document control system, management risks, adaptation and adoption of a continuous improvement approach, conducting internal audits, which is the overall evaluation seen element.

The industrial approach proposed SIPOC, could be an effective means of improving these processes.

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